

HUNTER VALLEY OPERATIONS



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Name of Operation	Hunter Valley Operations
Environment Protection Licence	640
Licensee	HV Operations Pty Ltd
Premises	Hunter Valley Operations Lemington Road Singleton NSW 2330 Australia
EPL Link	EPL 640 Website Link

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1 Introduction

This report has been compiled to provide a summary of environmental monitoring results for Hunter Valley Operations (HVO) in accordance with Environment Protection Licence (EPL) 640. This report includes all monitoring data collected in accordance with the aforementioned Licence for the period 1st – 31st December 2020.

Monitoring in this report includes:

- Air quality monitoring;
- Surface water monitoring including mine water discharge
- Blast monitoring
- Sewage treatment plant monitoring; and
- Noise monitoring

Monitoring locations are shown in **Figure 1**.

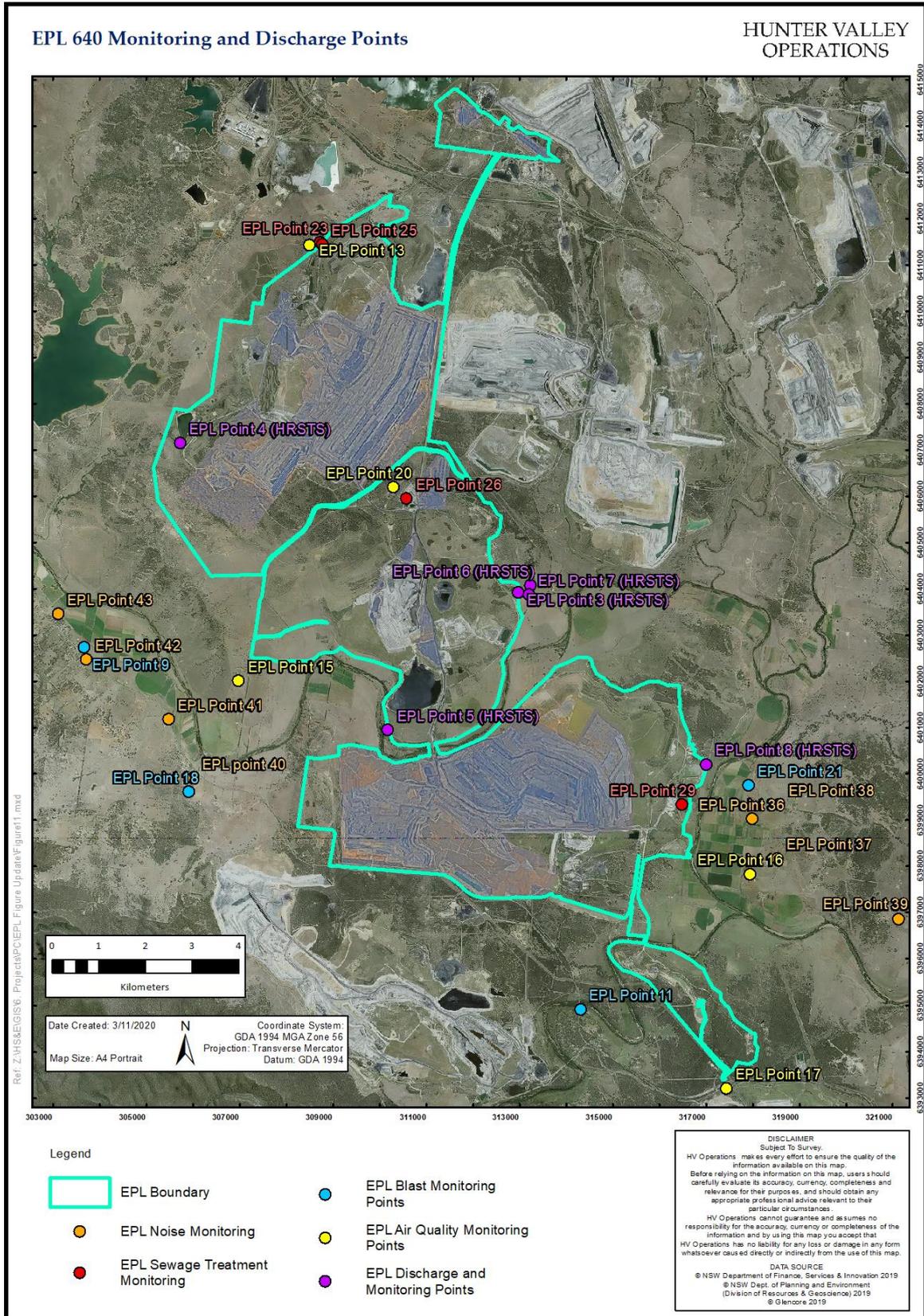


Figure 1 HVO Environmental Monitoring Locations

2 Air Quality

In accordance with the requirements of Condition M2.2 (EPL 640), HVO maintains a network of five PM₁₀ monitors. The following monitoring locations (EPA Monitoring Points 13, 15, 16, 17 and 20) are listed on the Licence for the purpose of monitoring:

- EPA Identification Number 13 – Howick
- EPA Identification Number 15 – Wandewoi
- EPA Identification Number 16 – Knodlers
- EPA Identification Number 17 – Golden Highway
- EPA Identification Number 20 – HVS Proposed

Results of particulate (PM₁₀) monitoring are shown in **Table 1**. Results reported represent the 24hr average PM₁₀, derived from 10-minute average PM₁₀ values for the period midnight to midnight, for each calendar date during the reporting period. The last sampling date was 31st December 2020; the data was obtained on 4th January 2021.

Table 1 Particulate Matter <10µm Monitoring

Date	Unit of Measure	Monitoring Frequency & Capture	Monitoring Point				
			Howick	HVS Proposed	Wandewoi	Knodlers	Golden Highway
1/12/2020	µg/m³	Continuous	50.1	73.2	37.0	40.7	42.2
2/12/2020	µg/m³		32.7	42.4	24.8	20.1	45.9
3/12/2020	µg/m³		24.2	25.0	17.2	14.8	20.4
4/12/2020	µg/m³		33.1	29.4	23.2	21.2	24.6
5/12/2020	µg/m³		50.1	49.4	29.4	30.1	41.2
6/12/2020	µg/m³		19.7	37.7	18.9	22.2	21.3
7/12/2020	µg/m³		30.6	51.9	17.8	52.4	26.4
8/12/2020	µg/m³		28.7	31.1	13.8	22.6	28.0
9/12/2020	µg/m³		56.3	49.0	27.3	25.7	23.7
10/12/2020	µg/m³		52.0	67.2	27.2	40.4	40.0
11/12/2020	µg/m³		28.1	27.4	16.3	15.9	25.9
12/12/2020	µg/m³		48.3	39.9	18.3	23.6	27.9
13/12/2020	µg/m³		30.8	20.5	15.2	16.6	13.7
14/12/2020	µg/m³		26.1	25.7	16.3	16.9	16.0
15/12/2020	µg/m³		9.2	14.3	6.5	8.5	8.6
16/12/2020	µg/m³		15.3	20.9	13.5	8.3	8.6
17/12/2020	µg/m³		19.2	17.0	8.9	12.3	10.5
18/12/2020	µg/m³		33.4	34.8	11.5	19.4	19.1
19/12/2020	µg/m³		17.7	12.7	13.1	12.4	13.7
20/12/2020	µg/m³		16.9	16.6	11.2	12.0	15.7
21/12/2020	µg/m³		9.9	11.8	11.1	10.5	14.1
22/12/2020	µg/m³		8.0	13.6	5.9	13.9	7.8
23/12/2020	µg/m³		17.1	30.0	13.4	19.1	14.9
24/12/2020	µg/m³		26.4	29.9	17.2	20.7	19.9
25/12/2020	µg/m³		18.0	20.7	15.2	16.4	16.1
26/12/2020	µg/m³		11.3	12.8	14.5	12.9	12.3
27/12/2020	µg/m³		17.1	16.1	12.3	14.8	15.1
28/12/2020	µg/m³		17.4	25.1	15.0	19.9	15.9

Date	Unit of Measure	Monitoring Frequency & Capture	Monitoring Point				
			Howick	HVS Proposed	Wandewoi	Knodlers	Golden Highway
29/12/2020	µg/m ³	Continuous	11.6	10.5	7.5	8.9	9.9
30/12/2020	µg/m ³		10.7	10.3	7.0	10.1	12.1
31/12/2020	µg/m ³		10.2	10.5	8.7	10.5	10.4
Monthly Meaningful Data							
December	µg/m ³	Minimum	8.0	10.3	5.9	8.3	7.8
	µg/m ³	Mean	25.2	28.3	16.0	19.2	20.1
	µg/m ³	Maximum	56.3	73.2	37.0	52.4	45.9
	µg/m ³	Median	19.7	25.1	15.0	16.6	16.0

3 Surface Water

HVO participates in the Hunter River Salinity Trading Scheme (HRSTS) and maintains six monitoring locations associated with this scheme (EPA Monitoring Points 3, 4, 5, 6, 7 and 8, Condition M2.4) as follows:

- EPA Identification Number 3 – Discharge Pipe from Dam 11N
- EPA Identification Number 4 – Discharge end of outlet pipe on Parnell’s Dam
- EPA Identification Number 5 – At the discharge end of the alluvial lands discharge pipeline
- EPA Identification Number 6 – In Farrell’s Creek within 100m, and upstream of the confluence of flow from Point 3
- EPA Identification Number 7 – In Farrell’s Creek within 100m, and downstream of the confluence of flow from Point 3
- EPA identification Number 8 – outlet of discharge pipe from Lake James storage dam

The location of these sampling points can be viewed in **Figure 1**.

There were discharge opportunities during the reporting period, however no water was discharged, As HVO did not discharge during the reporting period, no sample collection was required at Monitoring Points 3, 4, 5, 6, 7 and 8 (shown in **Table 2**).

Table 2 Mine Water Discharge Monitoring

Discharge Point	Date	Pollutant	Unit of Measure	Licence Limits	No. Samples Required by Licence	No. Samples Collected and Analysed
EPL ID 3	N/A	Electrical Conductivity	Microsiemens per Centimetre	-	0	0
		pH	pH	6.5-9.5	0	0
		Total Suspended Solids	Milligrams per Litre	120	0	0
EPL ID 4	N/A	Electrical Conductivity	Microsiemens per Centimetre	-	0	0
		pH	pH	6.5-9.5	0	0
		Total Suspended Solids	Milligrams per Litre	120	0	0
EPL ID 5	N/A	Electrical Conductivity	Microsiemens per Centimetre	400	0	0
		pH	pH	-	0	0
		Total Suspended Solids	Milligrams per Litre	-	0	0
EPL ID 6	N/A	Electrical Conductivity	Microsiemens per Centimetre	-	0	0
		pH	pH	-	0	0
		Total Suspended Solids	Milligrams per Litre	-	0	0

Discharge Point	Date	Pollutant	Unit of Measure	Licence Limits	No. Samples Required by Licence	No. Samples Collected and Analysed
EPL ID 7	N/A	Electrical Conductivity	Microsiemens per Centimetre	-	0	0
		pH	pH	-	0	0
		Total Suspended Solids	Milligrams per Litre	-	0	0
EPL ID 8	N/A	Electrical Conductivity	Microsiemens per Centimetre	-	0	0
		pH	pH	-	0	0
		Total Suspended Solids	Milligrams per Litre	-	0	0

4 Blast Monitoring

In accordance with the requirements of Condition M8.1, HVO maintains a network of blast monitors to measure Airblast overpressure and ground vibration for all blasts. The following monitoring location (EPA Monitoring Points 9, 11, 18 and 21) are listed on the Licence for the purpose of assessing compliance with the Airblast overpressure and ground vibration criteria as follows:

- EPA Identification Number 9 – Jerrys Plains
- EPA Identification Number 11 – Warkworth
- EPA Identification Number 18 – Moses Crossing
- EPA Identification Number 21 – Maison Dieu

The location of these monitors can be found in **Figure 1**. The last date sampled was 24th December; the data was obtained on 4th January 2021.

Blast monitoring results are detailed in **Table 3** and **Table 4**.

Table 3 Blast Monitoring (Airblast Overpressure)

Blast ID	Date & Time	Unit of Measure	Monitoring Frequency & Capture	EPL Limits			Monitoring Point		
				95% of Blasts	100% of Blasts	Moses Crossing	Jerrys Plains	Maison Dieu	Warkworth
P123BAC05A	2/12/2020 13:10	dB(L)	All Blasts 100%	115	120	99.7	103.7	103.1	98.2
P124WK501_A	2/12/2020 13:12	dB(L)		115	120	98.4	104.8	101.4	88.1
P124WK501_B	3/12/2020 13:19	dB(L)		115	120	89.5	87.1	86.5	91.8
WS43ULD01C	4/12/2020 13:05	dB(L)		115	120	90.6	102.4	104.8	112.0
WN45UAA07	4/12/2020 13:06	dB(L)		115	120	88.7	103.4	103.6	98.5
P123BAC06A	5/12/2020 12:14	dB(L)		115	120	92.0	101.1	91.3	95.3
WN43ULD04A	7/12/2020 09:23	dB(L)		115	120	92.5	93.8	94.6	101.3
P123BAC05B	8/12/2020 13:02	dB(L)		115	120	101.6	96.7	96.2	97.3
P205BAC03A	11/12/2020 13:31	dB(L)		115	120	112.0	107.5	101.7	90.5
P124WK202A	12/12/2020 17:14	dB(L)		115	120	112.1	104.9	86.4	86.9

Blast ID	Date & Time	Unit of Measure	Monitoring Frequency & Capture	EPL Limits			Monitoring Point		
				95% of Blasts	100% of Blasts	Moses Crossing	Jerrys Plains	Maison Dieu	Warkworth
P123BAC07A	14/12/2020 13:08	dB(L)	All Blasts 100%	115	120	101.8	96.4	103.2	94.7
WN45LAA02A	15/12/2020 13:03	dB(L)		115	120	93.6	96.2	86.4	90.1
P124WK202B	17/12/2020 13:02	dB(L)		115	120	97.5	102.1	99.9	101.3
WN45LAA02B	21/12/2020 13:19	dB(L)		115	120	88.9	92.8	81.6	94.4
WS44ULD01A	24/12/2020 12:59	dB(L)		115	120	87.7	91.6	83.8	87.5
Monthly Meaningful Data									
December		dB(L)	Minimum	115	120	87.7	87.1	81.6	86.9
		dB(L)	Mean	115	120	96.4	99.0	95.0	95.2
		dB(L)	Maximum	115	120	112.1	107.5	104.8	112.0
		dB(L)	Median	115	120	93.6	101.1	96.2	94.7

Table 4 Blast monitoring (Ground Vibration)

Blast ID	Date & Time	Unit of Measure	Monitoring Frequency & Capture	EPL Limits			Monitoring Point		
				95% of Blasts	100% of Blasts	Moses Crossing	Jerrys Plains	Maison Dieu	Warkworth
P123BAC05A	2/12/2020 13:10	mm/s	All Blasts 100%	5	10	0.13	0.04	0.09	0.82
P124WK501_A	2/12/2020 13:12	mm/s		5	10	0.1	0.02	0.03	0.35
P124WK501_B	3/12/2020 13:19	mm/s		5	10	0.1	0.06	0.04	0.5
WS43ULD01C	4/12/2020 13:05	mm/s		5	10	0.18	0.11	0.11	0.44
WN45UAA07	4/12/2020 13:06	mm/s		5	10	0.11	0.06	0.06	0.58
P123BAC06A	5/12/2020 12:14	mm/s		5	10	0.12	0.06	0.1	0.17
WN43ULD04A	7/12/2020 09:23	mm/s		5	10	0.19	0.15	0.15	0.19
P123BAC05B	8/12/2020 13:02	mm/s		5	10	0.14	0.08	0.1	0.15
P205BAC03A	11/12/2020 13:31	mm/s		5	10	0.12	0.04	0.34	0.29

Blast ID	Date & Time	Unit of Measure	Monitoring Frequency & Capture	EPL Limits			Monitoring Point		
				95% of Blasts	100% of Blasts	Moses Crossing	Jerrys Plains	Maison Dieu	Warkworth
P124WK202A	12/12/2020 17:14	mm/s	All Blasts 100%	5	10	0.1	0.03	0.03	0.16
P123BAC07A	14/12/2020 13:08	mm/s		5	10	0.14	0.05	0.12	0.32
WN45LAA02A	15/12/2020 13:03	mm/s		5	10	0.14	0.12	0.2	0.13
P124WK202B	17/12/2020 13:02	mm/s		5	10	0.1	0.04	0.05	0.43
WN45LAA02B	21/12/2020 13:19	mm/s		5	10	0.13	0.11	0.07	0.23
WS44ULD01A	24/12/2020 12:59	mm/s		5	10	0.23	0.19	0.18	0.23
Monthly Meaningful Data									
December		mm/s	Minimum	5	10	0.10	0.02	0.03	0.13
		mm/s	Mean	5	10	0.14	0.08	0.11	0.33
		mm/s	Maximum	5	10	0.23	0.19	0.34	0.82
		mm/s	Median	5	10	0.13	0.06	0.10	0.29

5 Sewage Treatment Plant Monitoring

Condition M2.4 of the Licence requires that HVO monitor for Faecal Coliforms on a quarterly basis at the following monitoring locations:

- EPA Identification Number 23 – Howick STP
- EPA Identification Number 25 – Howick Secondary Lagoon
- EPA Identification Number 26 – HVO North STP
- EPA Identification Number 29 – HVO South Secondary Lagoon

December sampling occurred on the 2nd December; the data was obtained on the 14th January 2021 and is shown in **Table 5** below.

Table 5 Sewage Treatment Plant Monitoring

Monitoring Site	Date & Time	Pollutant	Unit of Measure	Monitoring Result
EPA ID 23	02/12/2020 08:45	Faecal Coliforms	Colony forming units/100ml	700000
		pH	pH	7.11
EPA ID 25	02/12/2020 08:55	Faecal Coliforms	Colony forming units/100ml	-
		pH	pH	-
EPA ID 26	02/12/2020 10:30	Faecal Coliforms	Colony forming units/100ml	2000000
		pH	pH	7.61
EPA ID 29	02/12/2020 13:10	Faecal Coliforms	Colony forming units/100ml	450
		pH	pH	8.66

No sample was collected or analysed from EPA ID 25 in December as the sampling location was dry.

6 Noise

Condition M10.1 of the Licence requires that HVO undertake operator attended noise monitoring on a monthly basis at the following monitoring locations:

- EPA Identification Number 36 – NM1A
- EPA Identification Number 37 – NM1B
- EPA Identification Number 38 – NM1C
- EPA Identification Number 39 – NM2
- EPA Identification Number 40 – NM3
- EPA Identification Number 41 – NM4
- EPA Identification Number 42 – NM5
- EPA Identification Number 43 – NM6

Monitoring for the month of December occurred on the 3rd December; the data was obtained on the 24th December 2020 and is displayed in **Table 6** and **Table 7** below.

Table 6 Night LAeq,15minute Generated by HVO Against EPL Criteria

Location	Date & Time	Wind Speed (m/s)	Stability Class ¹	Criterion dB	Criterion Applies? ²	HVO LAeq dB ^{3,4}	Exceedance dB ^{4,5}
EPA ID 36	03/12/2020 12:00	3.4	D	41	No	NM	NA
EPA ID 37	03/12/2020 21:45	2.8	E	40	Yes	IA	Nil
EPA ID 38	03/12/2020 21:23	2.9	E	39	Yes	IA	Nil
EPA ID 39	03/12/2020 22:41	2.1	E	37	Yes	31	Nil
EPA ID 40	03/12/2020 23:19	1.9	E	39	Yes	IA	Nil
EPA ID 41	03/12/2020 21:52	2.8	E	39	Yes	NM	Nil
EPA ID 42	03/12/2020 21:26	2.9	E	40	Yes	30	Nil
EPA ID 43	03/12/2020 21:00	3.4	D	40	No	32	NA

Notes:

1. Atmospheric data is sources from HVO AWS
2. Noise criteria apply under all meteorological conditions except during period of rain or hail, wind speeds greater than 3m/s measured at 10 metres above ground level, stability category F conditions and wind speeds greater than 2m/s measured at 10m above ground level, or stability category G conditions.
3. Site-only LAeq,15minute attributed to HVO, including modifying factors if applicable.
4. Bold results in red indicate exceedance of criterion.
5. NA in exceedance column means atmospheric conditions outside specified in approval therefore criterion was not applicable.

Table 7 Night LA_{1,1minute} Generated by HVO Against EPL Criteria

Location	Date & Time	Wind Speed (m/s)	Stability Class ¹	Criterion dB	Criterion Applies? ²	HVO L _{Aeq} dB ^{3,4}	Exceedance dB ^{4,5}
EPA ID 36	03/12/2020 12:00	3.4	D	46	No	NM	NA
EPA ID 37	03/12/2020 21:45	2.8	E	46	Yes	IA	Nil
EPA ID 38	03/12/2020 21:23	2.9	E	46	Yes	IA	Nil
EPA ID 39	03/12/2020 22:41	2.1	E	46	Yes	39	Nil
EPA ID 40	03/12/2020 23:19	1.9	E	46	Yes	IA	Nil
EPA ID 41	03/12/2020 21:52	2.8	E	46	Yes	NM	Nil
EPA ID 42	03/12/2020 21:26	2.9	E	46	Yes	32	Nil
EPA ID 43	03/12/2020 21:00	3.4	D	46	No	39	NA

Notes:

1. Atmospheric data is sources from HVO AWS
2. Noise criteria apply under all meteorological conditions except during period of rain or hail, wind speeds greater than 3m/s measured at 10 metres above ground level, stability category F conditions and wind speeds greater than 2m/s measured at 10m above ground level, or stability category G conditions.
3. Site-only L_{Aeq,15minute} attributed to HVO, including modifying factors if applicable.
4. Bold results in red indicate exceedance of criterion.
5. NA in exceedance column means atmospheric conditions outside specified in approval therefore criterion was not applicable.